



(11) **EP 1 465 206 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**20.02.2008 Bulletin 2008/08**

(51) Int Cl.:  
**G21C 5/02 (2006.01) G06F 17/50 (2006.01)**

(43) Date of publication A2:  
**06.10.2004 Bulletin 2004/41**

(21) Application number: **04251900.9**

(22) Date of filing: **30.03.2004**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IT LI LU MC NL PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL LT LV MK**

(30) Priority: **31.03.2003 US 401602**

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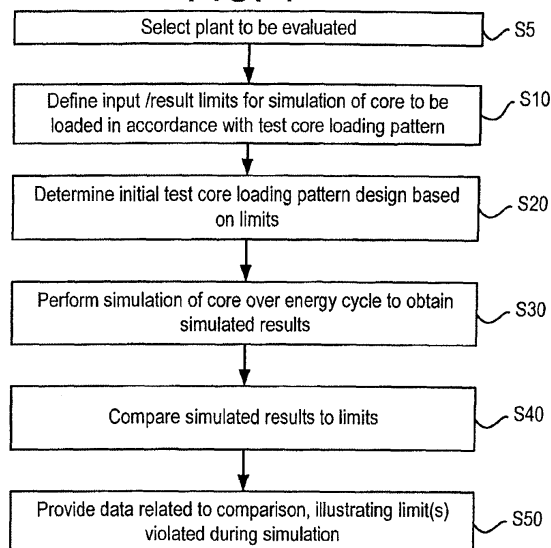
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(54) **Method and arrangement for developing core loading patterns in nuclear reactors**

(57) A method for developing core loading patterns in nuclear reactors in which a set of limits applicable to a core may be defined (S10), and a test core loading pattern design, to be used for loading the core, may be determined (S20) based on the limits. Reactor operation on at least a subset of the core may be simulated (S30) to produce a plurality of simulated results. The simulated results may be compared (S40) against the limits, and data from the comparison may indicate (S50) whether any of the limits were violated by the core during the simulation. A designer or engineer may use the data to modify the test core loading pattern, creating one or more derivative core loading pattern design(s) for simulation and eventual perfection as an acceptable core loading pattern design for the core.

**FIG. 4**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 04 25 1900

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |                                                    |
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| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Relevant to claim                | CLASSIFICATION OF THE APPLICATION (IPC)            |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>QUIST A J ET AL: "Application of nonlinear optimisation to reactor core fuel reloading"</p> <p>ANNALS OF NUCLEAR ENERGY ELSEVIER UK, vol. 26, no. 5, March 1999 (1999-03), pages 423-448, XP002464037</p> <p>ISSN: 0306-4549</p> <p>the whole document, in particular sections:</p> <p>'1 Introduction'</p> <p>'3.3.1 Starting values'</p> <p>-----</p>                                                                                                                                                                                                                        | 1-10                             | <p>INV.</p> <p>G21C5/02</p> <p>G06F17/50</p>       |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |                                                    |
| Place of search                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Date of completion of the search | Examiner                                           |
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| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p> <p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>.....</p> <p>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |                                                    |

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EPC FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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